Standing and moving breather solutions for a quasilinear wave equation

Wolfgang Reichel[1,*], **Gabriele Bruell**[1], **Simon Kohler**[1]

[1]*Department of Mathematics, Karlsruhe Institute of Technology, Karlsruhe, Germany*
[*]Email: `wolfgang.reichel@kit.edu`

For the quasilinear wave equation

$$g(x)\partial_t^2 u - \Delta u + \Gamma(x)\partial_t((\partial_t u)^3) = 0$$

with $(x,t) \in \mathbb{R}^{n+1}$ we are proving the existence of standing $(n = 1)$ and moving $(n = 2)$ breather solutions, i.e., solutions which are localized in space and periodic in time.

Under appropriate conditions on g and Γ we examine standing breathers via variational methods and moving breathers via bifurcation theory. Some of our analytical results are complemented by numerical simulations.